

Hazard Control Plan Cover Sheet

Work/Activity: Soil Sampling for the Soil Monitoring Program

Identification Number: LANL-RRES-ECO-SF-HCP/OP-007, R4

Author:

<u>Phil Fresquez</u>		
Name	Signature	Date

Initial Risk Level: Low

Consultation

☐ Not Required ☐ Required

Concurrence

☐ Not Required ☐ Required

<u></u>	<u></u>	<u></u>
Name (ECO Subject-Matter Expert)	Signature (as required)	Date

<u></u>	<u></u>	<u></u>
Name (Independent Peer)	Signature (as required)	Date

<u></u>	<u></u>	<u></u>
Safety Officer	Signature	Date

<u></u>	<u></u>	<u></u>
Team Leader	Signature	Date

Residual Risk Level: Minimal

Authorization of Work:

<u></u>	<u></u>	<u></u>
Group or Deputy Group Leader	Signature	Date

Next Review Date:

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1.0 INTRODUCTION

1.1 Background A description of the Soil Monitoring Program is provided in the Soil Monitoring portion of the Environmental Monitoring Plan for 1996–2001 (LA-UR-99-1117).

1.2 In this Document This procedure addresses the following major topics:

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1.3 History of Revision This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	10/4/96	New document
1	3/99	Reformatted in accordance with LIR300-00-01, Safe Work Practices
2	4/01	Added new Section 9.0, Training
3	4/02	Division reorganization and updated procedures.
4	4/03	Team name change to Environmental Surveillance.

2.0 PURPOSE

This RRES-ECO procedure describes the process for collecting soil as part of the Soil Monitoring Program, as mandated by DOE Order 5400.1, 5400.5.

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3.0 SCOPE

This procedure applies to the individual assigned to collect soil as part of the Soil Monitoring Program. The principal investigator (PI) is Phil Fresquez; the lead technician is Rick Velasquez, and the assistant is Louis Naranjo, Jr.

4.0 DEFINITIONS

- 4.1 Terms**
- Soil: Surface soil includes material from the 5-cm (0- to 2-in.) depth.
- Composite sample: Samples composed of the five sub-samples taken from an area.

5.0 RESPONSIBILITIES

- 5.1 Principal Investigator**
- PIs are responsible for
- Defining the components of and the processes associated with the work in sufficient detail to enable hazards to be identified and adequately controlled;
 - Determining required training for workers;
 - Ensuring that assigned workers are trained and meet authorization to work standards; and
 - Ensuring that workers have the knowledge, skills, and abilities needed to perform the work safely.

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- 5.2 Workers**
- Workers, with assistance as needed, are responsible for
- Identifying and evaluating the hazards associated with the work, as necessary, to ensure that the controls are adequate to perform the work safely;
 - Defining, establishing, and maintaining, as assigned, a hazard-control system that effectively mitigates the hazards associated with the work and meets institutional and facility requirements;
 - Determining that the work has been authorized before proceeding with it;
 - Acquiring the knowledge and skills needed to perform the work;
 - Obtaining and maintaining authorization to perform the work;
 - Understanding and following all operational requirements and restrictions related to the work;
 - Performing the work safely;
 - Improving the safety of the work by reviewing the work, commensurate with the level of risk, and incorporating lessons learned;
 - Using an appropriate change-control process to document and communicate changes made in the hazard control system; and
 - Stopping the work if it seems to be unsafe.

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5.0 RESPONSIBILITIES (Cont.)

5.3 Line Managers/Supervisors

Line managers/supervisors are responsible for

- Defining the scope of work;
- Ensuring that an effective hazard-control system is established to reduce the risk posed by the work to an acceptable level;
- A periodic review of the process used to assign and mitigate initial risk;
- Ensuring that institutional and facility requirements and restrictions on the work are followed;
- Authorizing the defined work, when the risk has been controlled to an acceptable level;
- Authorizing workers to perform the work, after they have documented adequate knowledge, skills, and abilities;
- Ensuring that workers perform the work safely;
- Improving the safety of the work by reviewing the work, commensurate with the level of risk, and ensuring the incorporation of lessons learned; and
- Ensuring that an appropriate change-control process is used to document and communicate changes made in the hazard-control system.

5.4 Subject Matter Experts

Not applicable to the procedures described in this document.

6.0 PRECAUTIONS AND LIMITATIONS

This document establishes the basic requirements for collecting soil samples for the Environmental Monitoring Program. This procedure applies to all personnel performing field procedures described in this document. Work performed under this procedure by LANL personnel will occur only after all other applicable procedures have been reviewed and signed as listed under Section 7.0 of this document.

7.0 SAFE WORK PRACTICE REQUIREMENTS

7.1 Define the Work: Collection of Samples

Project Personnel - In accordance with the procedure for field work, a minimum of two people is required to go out in the field.

Personal Protective Equipment - For soil sampling, the following personal protective equipment must be worn: safety glasses, safety/field shoes, rubber gloves, and a hat.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collection of Samples (cont.) Sample Locations - One composite sample should be collected from each of the following locations:

On-site Stations -- Stations on Laboratory property

- TA-21 (DP-Site)
- West of TA-53
- TA-50
- Two-Mile Mesa
- East of TA-54
- R-Site Road East
- Potrillo Drive/TA-36
- TA-16 (S-Site)
- Near Test Well DT-9
- Near TA-33
- TA-51
- East of TA-53

Sample Locations - One composite sample should be collected from each of the following locations (cont.):

Perimeter Stations -- Stations within 4 km (2.5 mi) of the Laboratory boundary (usually located downwind from major potential contaminant sources).

- Sportsman's Club
- North Mesa
- Near TA-8 (GT-Site)
- Near TA-49 (BNP)
- White Rock (East)
- Tsankawi/PM-1
- San Ildefonso
- Otowi
- East of airport
- West of airport

Regional Stations -- Stations located within the five counties surrounding Los Alamos County at a distance of up to 80 km (50 mi).

- Embudo
- Cochiti
- Jemez

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collection of Samples (cont.) Equipment Needed - Additional specific equipment required for going into the field is given in the operating procedure “General Field Work” (LANL-RRES-ECO-HCP/OP-001, R2).

The following equipment is required for soil sampling:

- safety glasses
- rubber gloves
- stainless steel soil ring (10-cm diameter), top, and ring-spatula
- 3-lb hammer
- soap/water solution (for washing the ring), water (for rinsing), paper towels
- 500-mL and 125-mL polyethylene bottles (one for each composite sample)
- ice chest with ice
- zip-lock bags (gallon size) and marker for labeling
- chain-of-custody forms, tape (see procedure LANL-RRES-ECO-HCP/OP-SF-008, R2, and Attachment 1)

Sampling Soil - Sampling guidelines set by the American Society for Testing and Materials (ASTM) were used to develop the guidelines followed by the Soils and Foodstuffs Team. Each year, plan trips to sampling locations and perform the following steps:

Each year, plan trips to sampling locations and perform the following steps (cont.):

Step	Action
1	Follow the procedure governing general field work (LANL-RRES-ECO-HCP/OP-001, R2). Check the condition of the vehicle and the fuel level before leaving for the field.
2	Locate the center of the sampling area, and place a clean 10-cm- (4-in.-) diameter stainless steel ring on the surface (see Attachment 2). Cover the ring with the stainless steel top.
3	Using a 3-lb hammer, drive the stainless steel ring 5 cm (2.0 in.) deep into the ground at the center and corners of a square area, 10-m (33-ft) per side. After driving the ring-sampler at a point, remove soil next to the soil ring-sampler, slip the spatula underneath the ring, and lift the sample. Place each of the five sub-samples into a 3-gallon zip-lock bag.
4	Thoroughly mix the sub-samples in the zip-lock bag to form a composite sample. Pour the composite into a 125-mL polyethylene bottle (for heavy-metal analysis) and a 500-mL poly bottle (for radionuclide analysis).
5	Seal each bottle with chain-of-custody tape. Label the bottle with the sample location, date, time, and your initials. Place each bottle into a 1-gallon zip-lock bag.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Step	Action
7	Wash ring, spatula, and top with the soap/water solution, rinse with water, and then dry with paper towels.
8	Once at the Lab, store the samples on ice or in a freezer until they are submitted to an analytical laboratory (normally within two working days).

Submittal of Samples

Submitting the Samples - Submit all samples to Paragon Analytics, Inc., for tritium, heavy metal, and radiochemical analyses.

Request the following analyses on the appropriate chain-of-custody forms:

- analysis of tritium content; reported in pCi/L of moisture
- analysis of the following heavy metals: Ag, As, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, Tl, and Zn (plus the others on EPA's Target Analyte List); reported in µg/g (dry weight)
- analysis of the following radionuclides: strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241; reported in pCi/g (dry weight)
- analysis of total uranium; reported in µg/g (dry weight)

7.2 Identify and Evaluate Hazards

<u>Hazard</u>	<u>Initial Risk Level based on Severity and Likelihood</u>
A) Off-road automobile accidents and tripping or falling hazards	LOW
B) Wildlife encounters (plague, hantavirus, ticks, etc.)	LOW
C) Environmental hazards (weather)	LOW
D) Lifting and moving heavy items	LOW
E) Repetitive motion and other ergonomic hazards	LOW

7.3 Develop and Implement Controls

7.3.1 Development

<u>Hazard</u>	<u>Hazard Control</u>	<u>Residual Risk Level</u>
A Off-road automobile accidents and tripping or falling hazards	LANL personnel will follow operating procedures discussing off-road vehicle use and tripping or falling hazards. Appropriate footwear and clothing will be worn by all LANL personnel. Personnel will have first aid/CPR training. Contract and NMDGF personnel will have a safety plan for conducting standard operations.	MINIMAL

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

7.3 Develop and Implement Controls (cont.)

7.3.1 Development (cont.)

<u>Hazard</u>	<u>Hazard Control</u>	<u>Residual Risk Level</u>
B Wildlife encounters (plague, hantavirus, ticks, etc.)	In accordance with recommendations set by the State of New Mexico Environmental Department, all personnel should wear long pants, long-sleeved shirts, and insect repellent. Do not handle dead or sick rodents. When you have returned from the field, perform a self-check for the presence of ticks.	MINIMAL
C Environmental hazards (weather)	LANL personnel will cease operations during inclement weather as described in RRES-ECO operating procedures for conducting general fieldwork. All work will be performed within a safe distance to vehicles. The distance will be based on current field conditions and terrain with respect to current and expected weather conditions.	MINIMAL
D Lifting and moving heavy items	Use carts and dollies. Use a helper	MINIMAL
E Repetitive motion and other ergonomic hazards	Take a short break every hour.	MINIMAL

7.3.2 Documentation

All personnel assigned to participate in soil sampling will have read this hazard control plan/operating procedure and will have signed an acknowledgment (Attachment 4).
Any future changes to this operating procedure will be properly documented and will be reflected by the revision number that is included with the document identification number.

7.3.3 Authorization of Work

All LANL workers involved with this activity will obtain authorization from their direct supervisor, group leader, or deputy group leader. No work will be performed until this authorization has been granted. The residual risk level for performing activities related to this activity have been determined based on consultation with subject matter experts including contractor personnel and LANL personnel experienced in this type of procedure.

All work related to this activity will be reviewed, at a minimum, on an annual basis, and this document updated to reflect changes as deemed necessary.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

7.3.4 Authorization of Workers LANL workers will be granted authorization to perform this work only after they have reviewed all appropriate required documentation and training that applies to LANL personnel. All contractor personnel will perform this work only after they have provided proof of appropriate documentation that applies to contractor responsibilities.

7.4 Perform Work Safely All personnel involved with this activity will adhere to all safety guidelines and procedures as described in the appropriate documents, including this document. Contractor personnel will be responsible for ensuring self-readiness checks before performing the work. LANL personnel will perform self-readiness checks before performing fieldwork. Field conditions, including weather conditions, will be evaluated as to the effect they will have on performing field activities safely. If activities can not be performed safely, all activities will cease until such time the LANL project leader authorizes work to resume.

7.5 Provide Feedback and Continuous Improvement At a minimum, the activity described in this document will be evaluated annually. If any changes are made to the procedure, those changes will be evaluated as to whether or not they may introduce new hazards. Any new hazards will be evaluated and appropriate controls implemented to reduce their risk to an acceptable level. A periodic review with project personnel will be made to evaluate the accuracy of this document with respect to field operations.

8.0 RISK DETERMINATION

The determination of risk for each activity described in this document was based on the Risk Determination matrix given in LIR300-00-01, Safe Work Practices.

9.0 TRAINING

The following training must be completed and confirmed by the PI of the project before work can begin:

For each worker:

- General Field Work HCP/OP (LANL-RRES-ECO-HCP/OP-001) must be read and documented.
- Thermal Stress Awareness Training must be taken when it becomes available

For each field crew:

- At least two people must have current First Aid Training.
- At least two people must have current CPR Training.
- Members must have site-specific training as required by the location where work is occurring.

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10.0 REFERENCES

- | | |
|-----------------------------------|--|
| 10.1 Source Documents | Documentation and additional training referenced in section 7.3.1 (hazard controls) include the following: <ul style="list-style-type: none">• LANL-RRES-ECO-HCP/OP-001, “General Field Work”• LA-UR-99-1117, “Environmental Monitoring Plan”• LANL-RRES-ECO-SF-HCP/OP-003, “Chain-of-custody for Environmental Samples”• “Standard practice for sampling surface soil radionuclides,” Annual Book of ASTM Standards, American Society for Testing and Materials, Philadelphia, PA, 1990. |
| <hr/> | |
| 10.2 Document Coordination | RRES-ECO (Ecology Group) of the Risk Reduction and Environmental Stewardship Division is the group of institutional coordination responsible for developing, revising, and maintaining the contents of this document. |

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ATTACHMENT 1: CHAIN-OF-CUSTODY RECORD

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Attachment 1

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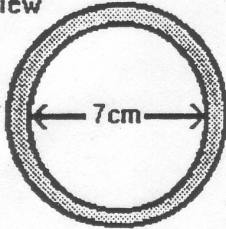
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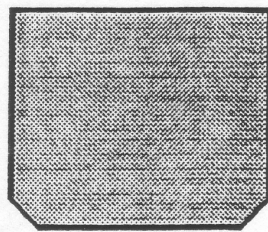
ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM

Stainless Steel Ring

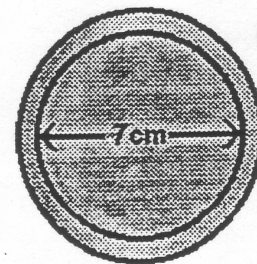
top view



side view

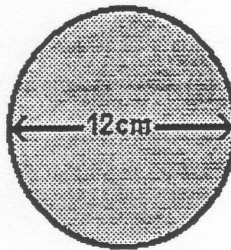


bottom

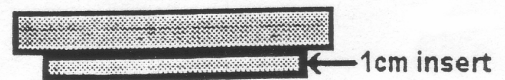


Stainless Steel Top

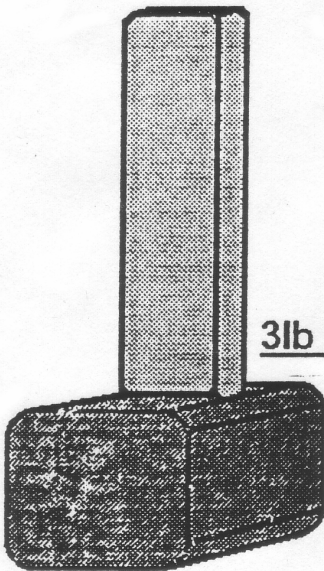
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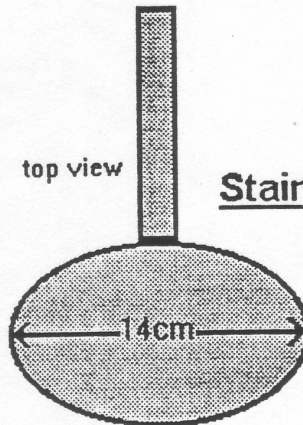
side view



3lb Hammer

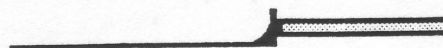


top view



Stainless Steel Spatula

side view



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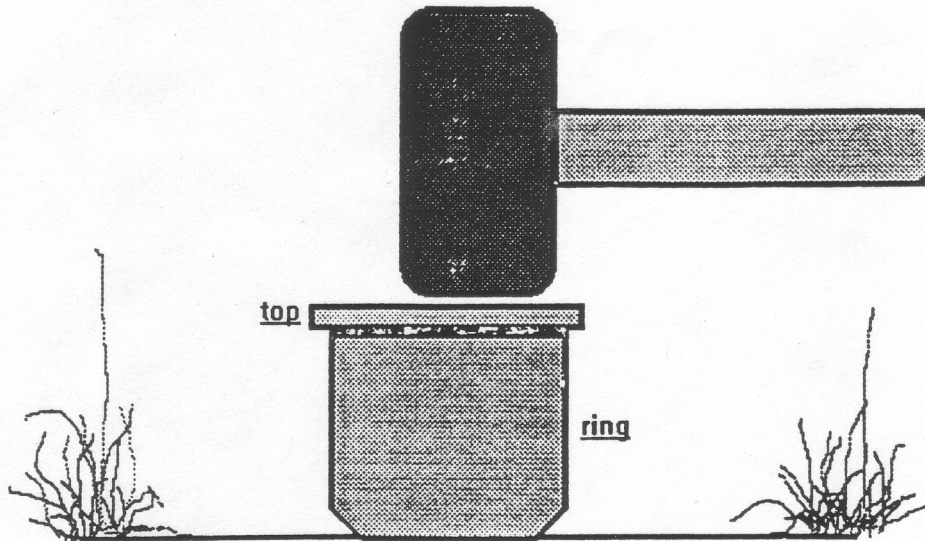
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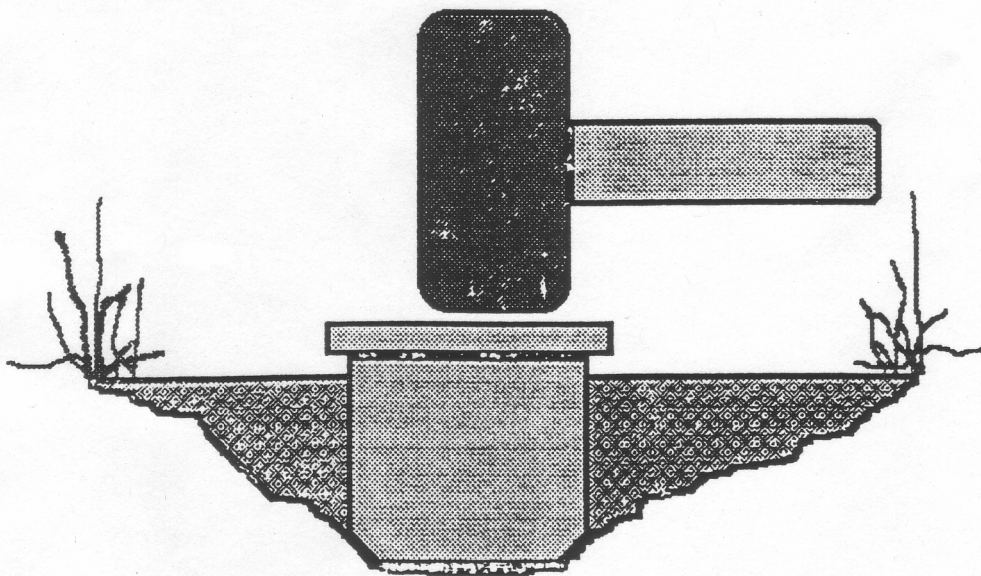
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ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM

Step 1. place ring on soil and start hammering



Step 2. hammer ring into soil



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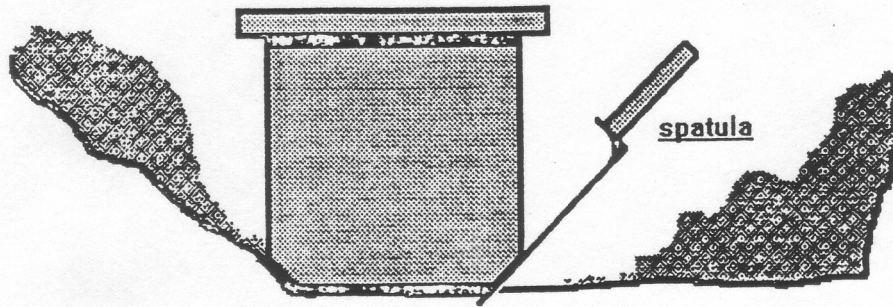
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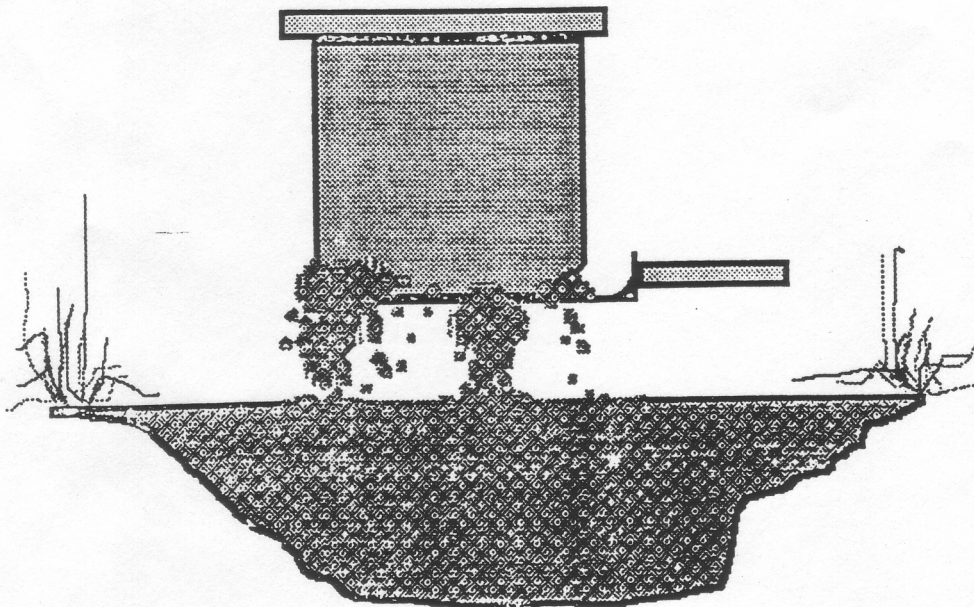
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ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM

Step 3. remove soil from surrounding of ring with spatula



Step 4. remove ring from soil with spatula and place soil into a sampling bag



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Attachment 3

Training Documentation Sheet

Hazard Control Plan/Operating Procedure for Soil Sampling for the Soil Monitoring Program

I, the undersigned, have read and fully understand the Hazard Control Plan/Operating Procedure for soil sampling for the soil monitoring program.

Trainee

Signature _____ Date _____

Print Name _____

Self-Study Training _____ Date _____
(Supervisor's signature)

On-the-Job Training _____ Date _____
(as required) (Supervisor's signature)